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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BIAGINI, CHRISTOPHER D	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/719,182	JAIN ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER D. BIAGINI	2142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed December 31, 2007 regarding the rejections of claims 1-3, 5-11, 13-19, and 21-27 under 35 USC 102(b) and claims 4, 12, 20, and 28 under 35 USC 103(a) have been fully considered but are not persuasive.

Applicant argues that the document "Packing Steiner Trees" (hereinafter, "the Jain reference") "was not described in a printed publication in this or a foreign country or in public use or sale in this country, more than one year prior to the date of application for the subject patent in the United States." The examiner respectfully disagrees. As explained in MPEP 2128, "[a] reference is proven to be a 'printed publication' 'upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.' Although the Jain reference may not have appeared in the Proceedings of Fourteenth Annual ACM-SIAM Symposium on Discrete Algorithms until some unknown date in 2003, the document was readily and publicly available at the web site for the Department of Computer Science at the University of Toronto at least as early as August 27, 2002. See the document titled "Publications and Manuscripts" provided with the last Office action, which clearly shows a hyperlink to the Jain reference and a modification date of August 27, 2002. Since August 27, 2002 is more than one year prior to the filing date of the instant application, the Jain reference is available as prior art under 35 USC 102(b).

The examiner further notes that the cited URL for the Jain reference provides evidence of the date on which it became publicly available. The "Wayback Machine" is a service provided by the Internet Archive (archive.org) which aims to provide snapshots in time of the World Wide Web. Periodically, the Wayback Machine retrieves publicly available documents from the Web and stores them in a database. Users can view these documents by date. As described in the attached document "Internet Archive Frequently Asked Questions," the date on which a document was retrieved is embedded in the URL for the document. Looking at the URL for the Jain reference,

`http://web.archive.org/web/20021005133245/http://www.cs.toronto.edu/~mreza/research/steiner-soda.ps`

it is clear that the document was retrieved on October 5, 2002. Thus, the document was available to the public on or before October 5, 2002, which is also more than one year prior to the filing date of the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-11, 13-19, and 21-27 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Jain et al. ("Packing Steiner Trees," hereinafter "Jain").

The Examiner notes that the differences between the disclosure of the instant application and the content of the cited paper appear to be largely legal boilerplate designed to place the subject matter more firmly in the technological arts.

Regarding claim 1, Jain shows a method comprising:

- generating a set of Steiner trees and paths from an undirected graph of vertices representing terminal and Steiner nodes (see paragraph 2 of introduction and section 2, "Preliminaries");
- merging the Steiner trees and the paths to produce linked and edge-disjoint S-Steiner trees such that if a subset *S* of the vertices is *k*-edge-connected, then there are $\alpha_{|S|}k$ edge-disjoint Steiner trees for *S*, where α_s is at minimum a sequence that tends to an asymptotic approximation factor of $|S|/4$ as *S* tends to infinity (see paragraphs 1-11 of section 3, "The Algorithm"); and
- utilizing the linked and edge-disjoint S-Steiner trees for a practical application of multiple applications, the multiple applications comprising data multicasting in a network to present information to a set of users and determining a VLSI circuit design to share an electric signal between terminals (see Abstract and Introduction).

Regarding claim 2, Jain shows the limitations of claim 1 as applied above and further shows wherein generating further comprises analyzing an undirected graph of vertices representing terminal and Steiner nodes to produce a Steiner tree between two terminal nodes of

the terminal nodes, the two terminal nodes now being processed nodes (see paragraphs 1 and 2 of the "Proof Sketch" for Theorem 3.2).

Regarding claim 3, Jain shows the limitations of claim 2 as applied above and further shows wherein generating further comprises:

- for each unprocessed vertex of the vertices, identifying one or more respective paths from the unprocessed vertex to each of a set of processed terminal vertices of the vertices to inductively grow the undirected graph by creating the Steiner trees, the unprocessed vertex now being a processed vertex;
- for each unprocessed vertex of the vertices, identifying one or more respective paths from the unprocessed vertex to each of a set of processed terminal vertices of the vertices to inductively grow the undirected graph by creating the Steiner trees, the unprocessed vertex now being a processed vertex; and
- for each Steiner tree:
    - determining if a path of the paths shares an edge with the Steiner tree; and
    - responsive to determining that the path shares the edge, shortcutting the path to a vertex of the Steiner tree by removing a portion of the path that is subsequent to the edge, each Steiner tree being used to shortcut a path of the paths being a path-tree.

See "Proof Sketch" for Theorem 3.2.

Regarding claim 5, Jain shows the limitations of claim 1 as applied above, and further shows wherein the substantially $\alpha_{|S|}k$ edge-disjoint Steiner trees for S are at minimum the following:

$$SOL_p(x) = x_0 + x_p - \left\lceil \left(x_0 - \sum_{i=p+1}^{s} ix_i \right) \Big/ p \right\rceil + \sum_{i=1}^{p-1} x_i = \left\lfloor \frac{p-1}{p} x_0 + \sum_{i=1}^{p} x_i + \sum_{i=p+1}^{s} \frac{i}{p} x_i \right\rfloor,$$

wherein x_0 represents the Steiner trees not used to shortcut any path, x_p represents Steiner trees used to shortcut a path.

See equation 3.4.

Regarding claim 6, Jain shows the limitations of claim 5 as applied above, and further shows wherein p is a number such that $\sum_{i=p+1}^{s} ix_i < x_0 \leq \sum_{i=p}^{s} ix_i$.

Regarding claim 7, Jain shows the limitations of claim 5 as applied above, and further shows wherein if $x_0 \leq sx_s$, $p = s$. See the second full paragraph on page 5.

Regarding claim 8, Jain shows the limitations of claim 5 as applied above, and further shows wherein if $\sum_{i=1}^{s} ix_i < x_0, p = 0$.

Claims 9-11, 13-19, and 21-27 correspond to claims 1-8, and are rejected for the same reasons as applied above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 12, 20, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain ("Packing Steiner Trees") in view of Wall et al. (US PGPUB 2003/0037160, hereinafter "Wall").

Jain shows the limitations of claims 1, 9, 17, and 25 as described above, and further shows wherein the vertices represent respective sending, receiving, and router network notes (see paragraph 2 of section 1, "Introduction"), and wherein the method further comprises:

- identifying one or more of the edge-disjoint Steiner trees that comprise each of a subset of nodes (necessary in order to associate movie streams with Steiner trees); and
- multicasting the streaming data to a subset of nodes over communication pathways identified by one or more of the edge-disjoint Steiner trees (note that "each stream of movie is broadcasted via a Steiner tree").

Jain does not explicitly show receiving a set of requests for streaming data from at least a subset of vertices of *S*, the at least a subset representing receiving network nodes.

Wall shows receiving a set of requests for streaming data from network nodes (see [0023] and [0025]). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Jain with the streaming data requests taught by Wall in order to allow clients to choose when to receive streaming data.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER D. BIAGINI whose telephone number is (571)272-9743. The examiner can normally be reached on weekdays from 8:30 AM to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571) 272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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